



DEPARTMENT OF THE ARMY
CHIEF OF ENGINEERS
2600 ARMY PENTAGON
WASHINGTON, DC 20310-2600

DAEN

JUN 25 2015

SUBJECT: Port Everglades Navigation Improvements Project, Broward County, Florida

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress the final feasibility report and environmental impact statement on navigation improvements for Port Everglades, Broward County, Florida. It is accompanied by the reports of the district and division engineers. This report was prepared as an interim response to a resolution by the Committee on Transportation and Infrastructure of the United States House of Representatives, dated 9 May 1996. Preconstruction engineering and design activities for the Port Everglades, Broward County, Florida Navigation Project will continue under the authority provided by the resolution cited above.

2. The reporting officers recommend a project that will contribute to the economic efficiency of commercial navigation. The national economic development (NED) plan includes a channel depth of 47 feet with associated widening. Based on Fiscal Year (FY) 2015 price levels, a 3.375-percent discount rate, and a 50-year period of analysis, the project first cost of the NED plan is \$305,300,000, with average annual benefits of \$46,900,000; average annual costs of \$15,900,000; and a benefit-to-cost ratio of 2.9. The non-federal sponsor, Broward County represented by its Board of County Commissioners, subsequently requested a locally preferred plan (LPP) of 48 feet with associated widening. The LPP has positive net benefits and is economically justified. In accordance with U.S. Army Corps of Engineers (USACE) policy, the LPP was submitted for consideration to the Assistant Secretary of the Army for Civil Works (ASA(CW)) and approved for consideration as the recommended plan on 16 October 2014. The recommended plan is the LPP and consists of the following improvements:

a. The project would deepen from the existing 42-foot mean lower low water (MLLW) channel to 48 feet MLLW from the outer entrance channel through the Southport Access Channel (SAC);

b. The following areas of widening are included as part of the new channel footprint for the recommended plan: Outer Entrance Channel: widen from the existing 500-foot channel width to 800 feet and extend 2,200 feet seaward; Main Turning Basin: widen by 300 feet, referred to as the widener, including reconfiguration of the U.S. Coast Guard (USCG) facility easterly on USCG property; SAC: widen by 250 feet and shift the existing 400-foot wide channel 65 feet to the east; Turning Notch (TN): widen by 100 feet parallel to the channel on the eastern edge of the SAC, and widen the western edge of the SAC to access the TN from the existing federal channel edge to a width of 130 feet at the north edge of the TN;

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c. The land required for the widener is federally owned and operated by the USCG. The USCG owns a total of 7.8 acres. Approximately one acre of uplands will be removed and turned into submerged lands to support the widening of the SAC. Use of the USCG property is necessary to allow deep draft vessels the ability to turn safely. The uplands being submerged will remain federally owned and be used for USCG vessels. The reconfiguration requires several USCG structures, facilities, and utilities to be shifted to the east onto adjacent federally owned property. The cost for this reconfiguration is included in the cost-shared project construction costs as a general navigation feature (GNF). A permit for use of real property by other federal agencies will be executed between the USCG and the Department of the Army for construction purposes;

d. Construction of the recommended plan involves dredging of approximately 5.5 million cubic yards of material. Material will be removed using a cutter head dredge or blasting with cutter head or clam shell removal and placed in ocean disposal. The proposed Ocean Dredged Material Disposal Site (ODMDS) is of sufficient capacity to include material from the 48-foot plan and future operations and maintenance (O&M), with no impact to long-term disposal capacity. All material dredged for construction is assumed to go to the ODMDS; and

e. To compensate for the unavoidable adverse effects of the action on various significant habitat types, USACE has proposed the following: mitigate for (a) the removal of approximately 7.41 acres of vegetated and unvegetated seagrass habitat (including that within the new channel footprint and resulting side slopes) and (b) the loss of approximately 1.16 acres of mangroves in the project footprint through use of ecosystem benefits from a previously permitted restoration project at West Lake Park (Broward County, FL), which is located in a county-operated, state-owned, natural area immediately to the south of the harbor. Mitigation for impacts will involve use of 2.4 seagrass functional units and one (1) mangrove functional unit, respectively, from that project. USACE has also proposed the following: mitigate for (c) the direct removal of approximately 14.62 acres of complex, high-profile, linear and spur/groove reef habitat through the creation of approximately 5 acres of artificial reef with the transplantation of 11,502 corals from the impact site to the artificial reef, as well as the enhancement of additional acreage through the outplanting of approximately 103,000 nursery raised corals to existing reefs. Additional mitigation will be provided for any direct and indirect impacts caused by dredging or increased turbidity/sedimentation. These mitigation components were determined to be economic "Best Buys" from among mitigation alternatives. The coral mitigation plan for reef impacts is included as a requirement in the Biological Opinion (BiOp) issued by the National Marine Fisheries Service (NMFS). Per a letter sent by NMFS to USACE on 1 May 2014, NMFS considers the scope of the coral mitigation plan as laid out in the BiOp, including associated monitoring and adaptive management actions, to be final with the exception of coordination of fine-scale construction level details and implementation of lessons learned from other similar efforts.

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3. Project Cost Breakdown based on October 2014 Prices.

a. Project First Cost: The estimated project first cost is \$322,700,000, which includes the cost of constructing the GNF and the lands, easements, rights-of-way (LER), and relocations. Broward County represented by its Board of County Commissioners is the non-federal cost-sharing sponsor for all features.

b. Estimated Federal and Non-Federal Cost Shares: The estimated federal and non-federal shares of the project first cost are \$220,200,000 and \$102,500,000 respectively, as apportioned in accordance with the cost sharing provisions of Section 101 of the Water Resources Development Act (WRDA) 1986, as amended (33 U.S.C. 2211), as follows:

(1) The cost for the GNF from greater than 20 feet to 45 feet will be shared at a rate of 75 percent by the government and 25 percent by the non-federal sponsor, plus

(2) The cost for the GNF from greater than 45 feet will be shared at a rate of 50 percent by the government and 50 percent by the non-federal sponsor, plus

(3) 100 percent of the costs attributable to dredging to a depth over the NED plan of 47 feet MLLW.

c. Additional 10 Percent Payment. In addition to the non-federal sponsor's estimated share of the total first cost of constructing the project in the amount of \$322,700,000 pursuant to Section 101(a)(2) of WRDA 1986, as amended, the non-federal sponsor must pay an additional 10% of the NED first costs (\$305,000,000) of GNF of the project, \$30,500,000, in cash over a period not to exceed 30 years, with interest.

d. Operations and Maintenance Costs. It is estimated that there will be an average annual increase of 5,700 cubic yards (CY) of shoal material to be dredged each year from the new project with an added annual O&M cost of \$55,500. The increase in annual O&M is primarily due to the increase in channel footprint (widening and channel extension).

e. Associated Costs. Estimated associated costs of \$200,000 include navigation aids, (a USCG expense).

f. Local Service Facilities and Non-Federal Berthing Area Costs. The cost for local service facilities and non-federal berthing area costs is approximately \$51 million dollars. These costs are 100% non-federal and are not included in the total first cost of the recommended plan.

g. Authorized Project Cost and Section 902 Calculation. The project first cost, for the purposes of authorization and calculating the maximum cost of the project pursuant to Section 902 of WRDA 1986, as amended, includes estimates for GNF construction costs, the value of LER and the value of relocations provided under Section 101(a)(3) of WRDA 1986, as amended. Accordingly, as set forth in paragraph 3.a. above, based on FY 2015 price levels, the

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estimated project first cost for these purposes is \$322,700,000 with a federal share of \$220,200,000 and a non-federal share of \$102,500,000.

4. Based on FY 2015 price levels, a 3.375-percent discount rate, and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$16,860,000. The average annual equivalent benefits are estimated to be \$48,240,000. The average annual net benefits are \$31,380,000. The benefit-to-cost ratio for the recommended plan is 2.9.

5. The federal government would be responsible for O&M of the navigation improvements proposed in this report upon completion of the construction contract. The federal government currently maintains the existing project. The contractor would be responsible for all maintenance during the construction contract.

6. Risk and uncertainty were evaluated for economic benefits, costs and sea level rise. Economic sensitivities examined the effects of commodity forecasts which had lower growth rates or capped the growth earlier in the period of analysis. In accordance with the USACE Engineering Circular (EC) on sea level change, the study analyzed four sea level rise rates; historic, baseline, intermediate, and high. Based on a 50-year period of analysis of historical sea level measurements taken from National Ocean Service (NOS) gage 8723170 at Miami Beach, Florida, the historic sea level rise rate was determined to be 2.39 mm/year (0.0078 ft/year) (<http://tidesandcurrents.noaa.gov/sltrends/index.shtml>). Analysis shows that the sea level rise values for the baseline, intermediate, and high levels of future sea level rise at the end of the 50-year period of analysis are projected to be 0.39 feet, 0.84 feet, and 2.25 feet, respectively. In general, regional sea level rise (baseline, intermediate, and high) will not affect the functioning of the project alternatives or the overall safety of the vessels. While there is expected to be a small increase in tide range and storm surge penetration for all three scenarios, the structural aspects of the project will be either unaffected or can be easily adapted to accommodate the change.

7. In accordance with the USACE EC on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and vigorous review process to ensure technical quality. This included District Quality Control, Agency Technical Review, Policy and Legal Compliance Review, Cost Engineering Mandatory Center of Expertise Review and Certification, Independent External Peer Review (IEPR), and the review and approval of technical models. The IEPR was completed by Battelle Memorial Institute. An initial IEPR was conducted on the draft report in 2013 and a second IEPR was completed on the final report in 2014. The first review resulted in one comment of high significance and the second review resulted in five comments of medium high to high significance. The IEPR comments identified concerns in the areas of engineering assumptions, economic analysis, and environmental considerations. All comments from the above referenced reviews have been incorporated into the final document. Overall, the reviews resulted in improvements to the technical quality of the report.

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8. Washington level review indicates that the plan recommended by the reporting officers is technically sound, environmentally and socially acceptable, and on the basis of congressional directives, economically justified. The plan complies with all essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land Related Resources Implementation Studies. The recommended plan complies with other Administration and legislative policies and guidelines. The views of interested parties, including federal, state and local agencies have been considered.

9. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that navigation improvements for Port Everglades be authorized in accordance with the reporting officer's recommended plan at an estimated first cost of \$322,700,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 101 of WRDA 1986, as amended. This recommendation is subject to the non-federal sponsor agreeing to comply with all applicable federal laws and policies including that the non-federal sponsor must agree with the following requirements prior to project implementation.

a. Provide; during the periods of design and construction, funds necessary to make its total contribution for commercial navigation equal to:

(1) 25 percent of the cost of design and construction of the GNFs attributable to dredging to a depth in excess of -20 feet MLLW but not in excess of -45 feet MLLW, plus

(2) 50 percent of the cost of design and construction of the GNFs attributable to dredging to a depth in excess of -45 feet MLLW but not in excess of -47 feet MLLW, plus

(3) 100 percent of the costs attributable to dredging to a depth over -47 feet MLLW;

b. Provide all LER, including those necessary for the borrowing of material and placement of dredged or excavated material, and perform or assure performance of all relocations, including utility relocations, all as determined by the government to be necessary for the construction or O&M of the GNFs;

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the GNFs, an additional amount equal to 10 percent of the total cost of construction of the NED GNFs less the amount of credit afforded by the government for the value of the LER and relocations, including utility relocations, provided by the non-federal sponsor for the GNFs. If the amount of credit afforded by the government for the value of LER and relocations, including utility relocations, provided by the non-federal sponsor equals or exceeds 10 percent of the total cost of construction of the GNFs, the non-federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of LER and relocations, including utility relocations, in excess of 10 percent of the total costs of construction of the GNFs;

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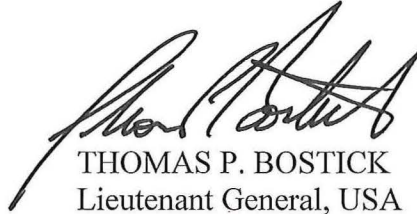
- d. Provide, operate, and maintain, at no cost to the government, the local service facilities in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the government;
- e. In the case of project features greater than -47 feet MLLW in depth, provide 100 percent of the excess cost of O&M of the project over that cost which the government determines would be incurred for O&M if the project had a depth of 47 feet;
- f. Accomplish all removals determined necessary by the federal government other than those removals specifically assigned to the federal government;
- g. Give the government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating and maintaining the GNFs;
- h. Hold and save the United States free from all damages arising from the construction or O&M of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors;
- i. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under LER that the government determines to be necessary for the construction or O&M of the GNFs. However, for LER that the government determines to be subject to the navigation servitude, only the government shall perform such investigation unless the government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;
- j. Assume complete financial responsibility, as between the government and the non-federal sponsor, for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LER that the government determines to be necessary for the construction or O&M of the project; and
- k. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA.

10. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the Executive Branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the state of Florida, Broward County represented by its Board of County

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Commissioners (the non-federal sponsor), interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

A handwritten signature in black ink, appearing to read "Tom Bostick", is positioned above the printed name and title.

THOMAS P. BOSTICK
Lieutenant General, USA
Chief of Engineers